Coding Challenge

Question

In the cinema business, a feature film is usually provided to a regional distributor based on a contract for exhibition in a particular geographical territory.

Each authorization is specified by a combination of included and excluded regions. For example, a distributor might be authorized in the following manner:

```
Permissions for DISTRIBUTOR1
INCLUDE: INDIA
INCLUDE: UNITEDSTATES
EXCLUDE: KARNATAKA-INDIA
EXCLUDE: CHENNAI-TAMILNADU-INDIA
```

This allows DISTRIBUTOR1 to distribute in any city inside the United States and India, *except* cities in the state of Karnataka (in India) and the city of Chennai (in Tamil Nadu, India).

At this point, asking your program if DISTRIBUTOR1 has permission to distribute in CHICAGO-ILLINOIS-UNITEDSTATES should get YES as the answer, and asking if distribution can happen in CHENNAI-TAMILNADU-INDIA should of course be NO. Asking if distribution is possible in BANGALORE-KARNATAKA-INDIA should also be NO, because the whole state of Karnataka has been excluded.

Sometimes, a distributor might split the work of distribution amount smaller sub-distributors inside their authorized geographies. For instance, DISTRIBUTOR1 might assign the following permissions to DISTRIBUTOR2:

```
Permissions for DISTRIBUTOR2 < DISTRIBUTOR1
INCLUDE: INDIA
EXCLUDE: TAMILNADU-INDIA
```

Now, DISTRIBUTOR2 can distribute the movie anywhere in INDIA, except inside TAMILNADU-INDIA and KARNATAKA-INDIA - DISTRIBUTOR2's permissions are always a subset of DISTRIBUTOR1's permissions. It's impossible/invalid for DISTRIBUTOR2 to have INCLUDE: CHINA, for example, because DISTRIBUTOR1 isn't authorized to do that in the first place.

If DISTRIBUTOR2 authorizes DISTRIBUTOR3 to handle just the city of Hubli, Karnataka, India, for example:

```
Permissions for DISTRIBUTOR3 < DISTRIBUTOR2 < DISTRIBUTOR1
INCLUDE: HUBLI-KARNATAKA-INDIA
```

Again, DISTRIBUTOR2 cannot authorize DISTRIBUTOR3 with a region that they themselves do not have access to.

We've provided a CSV with the list of all countries, states and cities in the world that we know of - please use the data mentioned there for this program. *The codes you see there may be different from what you see here, so please always use the codes in the CSV*. This Readme is only an example. Write a program in any language you want

Introduction:

The scenario described in the question shows the film distribution process. The distributor gets registered or gets contract by authorizing include and exclude regions. Distributor has permission to distribute in all the cities of the state if it is included. Similarly for country, else permission is denied. The distributor might get split work from a distributor, called as sub-distributor. In such case the sub distributor is subset of parent distributor.

Algorithm:

Step 1: User choose from the option 1.Add Distributor 2.View Distributor 3.Check Permissions 4. Quit. If user enters apart from given option then error message pops.

Step 2: If user input is option 1 then user continue by choosing 1. Direct Distributor 2. Sub Distributor.

Both Direct Distributor and Sub Distributor gets details (Name, Permissions to Include and Exclude permission) from user. Sub Distributor additionally requires Parent Distributor Name.

After validating all inputs, data is stored in server.

Step 3: If user input is option 2, Distributors name are fetched from server and displayed with corresponding Parent Distributor names. If no parent then '–' is displayed.

Step 4: On selecting option 3, user continues by entering the Distributor name and location to check for permissions.

Validation is performed for the given input by checking whether the distributor is already registered and location is a valid one or not.

If the distributor has no parent distributor then the location is cross checked with data in server. Else the permissions of parent distributor is also added with sub distributor data and result is displayed.

Step 5: By selecting option 4, the user can quit the program.

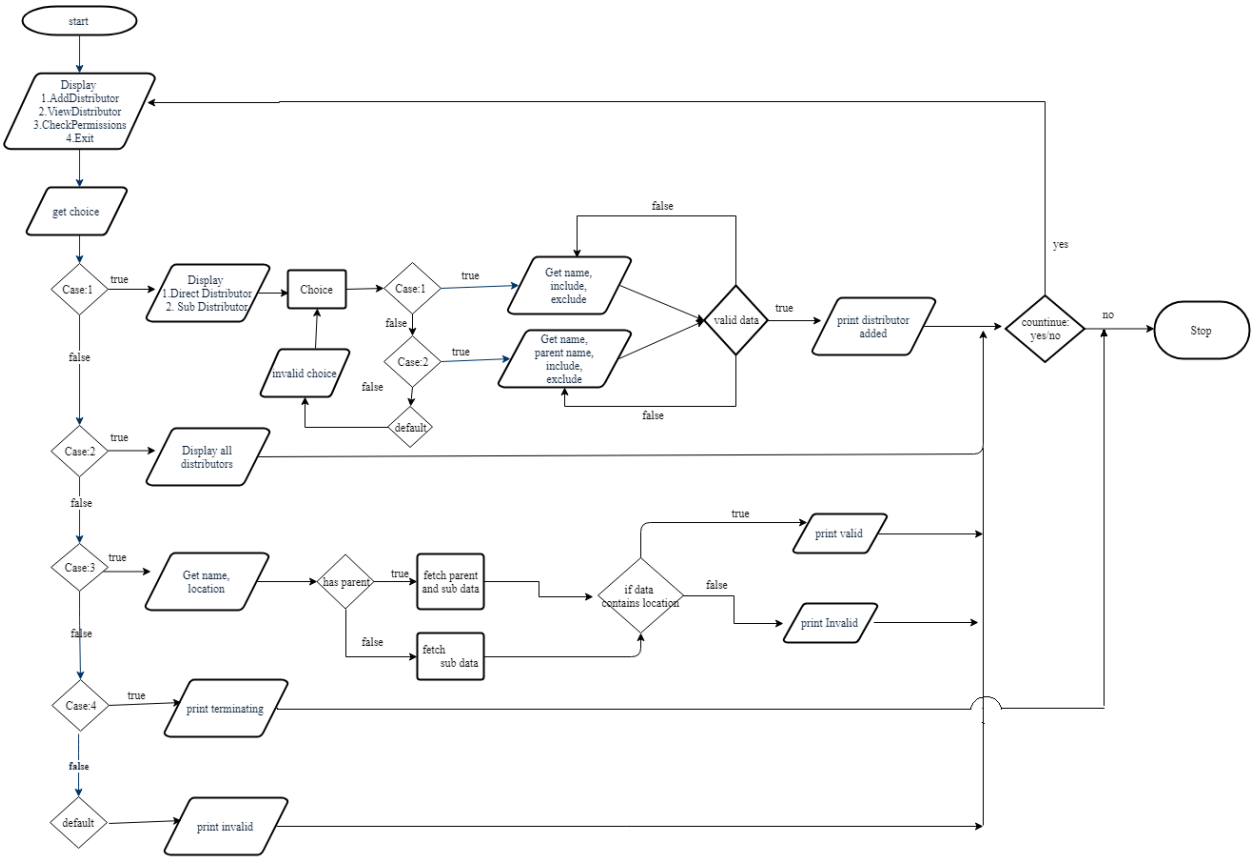
Step 6: The process repeats from step 1 until user enter 'no' as input for 'continue: yes/no'.

Validations Performed:

- ✓ Inputs cannot be null or whitespace.
- ✓ Distributor names are unique.
- ✓ Parent distributor name must be distributor name already registered.
- ✓ The location entered must be valid name. Combination of alphabets cannot be a valid location (Example: computer is not valid location; India is valid location), whitespaces, null string, special characters are invalid.
- ✓ Both include and exclude permissions cannot be same.

Flow chart:

Flow chart is attached as 'flow chart.png' with this file for better quality.



Film Distribution Flow Chart

Conclusion:

This java program developed meets up all the requirements and validations. By using this, chaos in distribution process among distributors can be solved.